House Price Prediction  
using Machine Learning Techniques

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**ABSTRACT**

The critical problem in the construction industry is that building projects are completed at cost much higher than estimated project cost, hence it is essential to develop a cost prediction model that imprison all factors affecting the project cost using regression analysis through set of objectives such as: to locate the factors affecting the project cost; analyze the significance of the factors and develop cost predictive model. Literature review on the study stipulates that nature of clients, professional involved in a project and their choice regarding design, function, duration, technology and execution have significant effect on the overall project cost. Data for the study are obtained through random sampling of building projects completed in various location. The study points out the seven most exceptional factors to project cost such as: design related factors, time or cost related factors, parties experience related factors, financial issues related factors, bidding situations related factors , project characteristics related factors and estimating process related factors. These selected key factors are to be used for cost predictive model. The cost prediction model is developed with the help of machine learning technique.

INTRODUCTION

Success of construction projects is examined by meeting to budget, timing, and quality of work as per owner's expectations. Construction manager or contractor needs effective tools for budget or cost estimation and work scheduling. Budget or cost prediction in early-stage plays a very important role in any construction project. An incorrect budget or cost forecasting can easily turn an estimated profit into loss.Cost estimation of construction projects is a difficult problem because it is affected by many variable factors. There are number of categories that can have major impacts on project costs. Such factor include the cost of materials, transportation charges, site condition, the size of the project, schedule of the project etc. From those factors one of the most important factor is materials cost which affect the total construction cost.

The construction cost prediction problem is formulated as multivariable problem and experimented with methods such as regression , artificial neural network and support vector machine . These estimation methods, use some historical data of cost and find a functional relationship between change in cost and the factors on which the cost is depended. The main issue of cost estimates in construction projects includes the detailed project information, changes in design parameters, uncertainties regarding project development etc. Linear regression analysis shows little success. The statistical methods and regression analysis are used conventionally in literatures for cost estimation. All traditional methods have limitations in accurate project cost prediction due to the large number of significant variables and interactions between these variables. Artificial intelligence approaches such as neural networks, evolutionary algorithms.

SOFTWARE REQUIREMENTS

**Software Required**: Python, pycharm IDE.

**Prgrammning Languagues**: Python

**Internal Libraries**:Flasgger,pickle,html,css,pandas-profiling,pandas,numpy,skrit-learn,etc.,

**Algorithms used**: classifying models,linear Regression.

HARDWARE REQUIREMENTS

Processor: intel® Core™ i5-7200U CPU @ 2.50Hz 2.70GHz

RAM: 4GB

Operating systems: Windows 10 Home Basic 64-bit